Item 78N FY96
04DS1
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ANALYZER, SPECTRUM

AN1KM-H

1.0 GENERAL This procurement requires a portable spectrum analyzer with an internal or external tracking generator.

2.0 CLASSIFICATION Type II, Class 5, Style C, and Color R in accordance with MIL-T-28800 for shipboard applications. The tilt-bail handle requirement is invoked. When an external tracking generator is provided the generator shall meet the Type II, Class 5, Style E, and Color R requirements of MIL-T-28800.

a. Maximum humidity limited to 85%.

2.1 Electromagnetic Interference The requirements of MIL-T-28800 and MIL-STD 461B (Parts 4 and 5) are limited as follows:

CE01 (Narrowband), 1 kHz to 15 kHz; CE03 (Broadband), 20 dB relaxation from 15 kHz to 100 kHz; RE01, 15 dB relaxation to 30 kHz and limited to 30 kHz; RE02, full limits <1 GHz; RS02, deleted; RS03, 1V/meter from 14 kHz to 1 GHz, 20 dB relaxation at IF frequencies.

3.0 MEASUREMENT REQUIREMENTS The equipment shall be capable of spectrum analysis within the following minimum specifications.

3.1 Frequency Measure

3.1.1 Range: 100 Hz to 1.8 GHz

3.1.2 Accuracy: ±[15% x resolution bandwidth + 5% x span + (frequency readout x frequency ref accuracy) + 15 kHz] {Span > 2 Mhz} ±[15% x resolution bandwidth + 5% x span + (frequency readout x frequency ref accuracy) + 25 Hz] {Span < 2 MHz}

3.1.3 Resolution: 1% or less of the selected span. This resolution may be provided by the signal counter.

3.1.4 Stability: After a 1 hour warmup, the frequency drift shall not exceed 50 Hz per minute of sweep time for spans of 100 kHz or less.

3.1.5 Sweep
3.1.5.1 Time: At least 200 µsec to 50 sec in zero span mode
3.1.5.1.1 Accuracy: ±20% of setting
3.1.5.2 Trigger: Internal (free run), external, single, video

3.1.6 Span
3.1.6.1 Widths: 100 Hz to 1 MHz
3.1.6.2 Accuracy: ± 5%

3.2 Amplitude Measure

3.2.1 Range: +30 dBm to displayed average noise level
3.2.1.1 1 dB Gain compression.: Mixer level > -5 dBm
3.2.1.2 Dynamic Range: At least 80 dB at 10 dB/div

3.2.2 Accuracy: ±2 dB log mode

3.2.3 Flatness: ±1.5 dB maximum

3.2.4 Distortion
3.2.4.1 Residual noise. Spurious responses with no signal input:
3.2.4.1.1 100 Hz to 500 Hz: -65 dBm or less
3.2.4.1.2 500 Hz to 200 kHz: -85 dBm or less
3.2.4.1.3 200 kHz to 1.8 GHz: -90 dBm or less
3.2.4.2 Harmonic distortion: At least -60 dBc for an input mixer signal level of -40 dBm
3.2.4.3 Third-order intermodulation products. Input mixer signal level of -30 dBm:
3.2.4.3.1 100 Hz to 10 MHz: at least -64 dBc
3.2.4.3.2 10 MHz to 1.8 GHz: at least -70 dBc
3.2.4.4 Noise sidebands. The noise sidebands shall be at least -100 dBc/Hz at offsets from a 1 GHz carrier of 30 x resolution bandwidth with resolution bandwidths of 1 kHz or greater.

3.2.5 Reference Level: At least +30 dBm to -80 dBm

3.2.6 Attenuator: At least 0 to + 60 dB ± 2.0 dB

3.3 Marker/s

3.3.1 Modes: 1 or 2 independent markers
3.3.1.1 Single: One marker displays ABSOLUTE Frequency & Amplitude
3.3.1.2 Delta: Two markers display Frequency and Amplitude DIFFERENCE

3.3.2 Resolution
3.3.2.1 Frequency: Same as 3.1.3 or better
3.3.2.2 Amplitude: 0.1 dB or better

3.4 Signal Counter Capable of counting signals within the specified frequency range

3.4.1 Accuracy: ±[(marker frequency x frequency reference accuracy) + 50 Hz + 1 LSD]

3.4.2 Resolution: Selectable from at least 1 Hz to 1 kHz

3.5 Resolution Bandwidth: Selectable from 10 Hz to 1 MHz in 1, 3, 10 sequence

3.5.1 Accuracy: ±20% of the selected bandwidth; ±25% at 1 MHz; ±30% at 10 Hz

3.6 Video Bandwidth Selectable from at least 1 Hz to 30 kHz

3.7 Miscellaneous

3.7.1 Input impedance: 50 ohms nominal. 1.5:1 maximum VSWR with 10 dB or more input attenuation selected

3.7.2 Vertical display modes. Log 10 dB/div, log 2 dB/div, and linear V

3.7.3 Digital storage. Digital storage shall be provided with selectable modes that compare and subtract two signals, and save maximum signal values and noise-average spectral displays. The digital storage function shall be capable of storing and displaying at least eight spectrums including the readout measurement parameters. When batteries are required for digital storage circuitry, they shall have a useful life of at least 12

months under normal operating conditions within the operating temperature range.

3.7.4 Display specifications. A display with an internal graticule of at least 8 x 10 divisions shall be provided. The display shall provide a readout of center frequency, span or span/div, resolution bandwidth, vertical scale factor, reference level, marker readout of frequency and amplitude, video filter selection, and RF attenuation. The display area shall be at least
6.5 cm (2.56 in) high by 7.5 cm (2.95 in) wide.

3.8 Inputs/Outputs

3.8.1 RF Input. Type N (female)
3.8.1.1 Impedance: 50 ohms
3.8.1.2 VSWR: 1.5:1

3.8.2 Tracking generator. The equipment shall be provided with a tracking generator that meets
the following specifications:
3.8.2.1 Frequency range: 300 kHz to 1.8 GHz
3.8.2.2 Output level: 0 dBm
3.8.2.3 Attenuation range: 60 dB in 10 and 1 dB steps
3.8.2.4 Flatness: ±2.25 dB
3.8.2.5 Residual FM: 50 Hz peak-to-peak
3.8.2.6 Output impedance: 50 ohms nominal
3.8.2.6.1 Connector: Type N
3.8.2.6.2 VSWR: 2:1 max across the frequency range
3.8.2.7 Spurious outputs: -20 dBc

3.8.3 Reference Output
3.8.3.1 Frequency: 10 MHz
3.8.3.1.1 Accuracy: ±15 ppm or less after 1 hour warm-up
3.8.3.2 Amplitude: -10 dBm to +2 dBm
3.8.3.3 In/Out Connector: BNC female

4.0 GENERAL REQUIREMENTS

4.1 Power Source MIL-T-28800 nominal power source requirements are invoked. Maximum power consumption: 250W

4.2 Lithium Batteries Per MIL-T-28800, lithium batteries are prohibited without prior authorization. Requests for approving the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.3 Weight 21 kg (46 lb) maximum

4.4 Digital interface A digital interface in accordance with MIL-T-28800